

AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior versions of the claims and all prior listings of the claims in the present application.

1-18. (canceled)

19. (currently amended) A method of assembling tyres for vehicle wheels,
comprising:

disposing a carcass structure on a primary drum by assembling component parts
of the carcass structure on the primary drum;

disposing a belt structure on an auxiliary drum;

picking up the belt structure from the auxiliary drum to transfer the belt structure
to a position coaxially centered with respect to the carcass structure; and

applying a tread band onto the belt structure;

wherein the carcass structure comprises at least one carcass ply in engagement
with annular anchoring structures axially spaced apart from each other,

wherein the belt structure comprises at least one belt layer,[[and]]

wherein applying the tread band is carried out by winding up at least one
continuous strip element of elastomer material in contiguous circumferential coils
around the belt structure

wherein application of the tread band is carried out before picking up the belt
structure from the auxiliary drum;

wherein during disposing the belt structure on the auxiliary drum, the auxiliary drum is arranged in a coaxial-alignment relationship with the primary drum and interacts with devices for application of the belt structure;

wherein after disposing the belt structure and before winding up said at least one continuous strip element of elastomer material, a step of moving the auxiliary drum away from a vertical plane containing the rotation axis of the primary drum towards a delivery member feeding the strip like element is carried out, starting from said coaxial-alignment relationship with the primary drum; and

further comprising the step of moving the auxiliary drum away from said delivery member to position the auxiliary drum again in ~~the axial-alignment~~ coaxial alignment relationship with respect to the primary drum, once application of the tread band has been completed.

20. (cancelled)

21. (previously provided) The method of claim 19, wherein the at least one strip element is fed from at least one delivery member disposed close to the belt structure, simultaneously with winding up the at least one strip element around the belt structure.

22. (previously provided) The method of claim 21, wherein feeding the at least one strip element is carried out by extrusion through the at least one delivery member.

23. (previously provided) The method of claim 21, further comprising:

giving the auxiliary drum carrying the belt structure a circumferential-distribution rotary motion around a geometric rotation axis of the auxiliary drum, so that the at least one strip element is circumferentially distributed around the belt structure; and

carrying out controlled relative transverse-distribution displacements between the auxiliary drum and the at least one delivery member, so that the at least one strip element forms a plurality of coils disposed in mutual side-by-side relationship to define the tread band;

wherein giving the auxiliary drum the circumferential-distribution rotary motion and carrying out the controlled relative transverse-distribution displacements are carried out concurrently with winding up the at least one strip element.

24. (previously provided) The method of claim 23, wherein the controlled relative transverse-distribution displacements are carried out by movement of the auxiliary drum.

25. (previously provided) The method of claim 23, wherein the circumferential-distribution rotary motion and the controlled relative transverse-distribution displacements are carried out by an actuating assembly engaging the auxiliary drum.

26. (cancelled)

27. (cancelled)

28. (cancelled)

29. (previously provided) The method of claim 19, wherein the belt structure transferred to the position coaxially centered with respect to the carcass structure is coupled with the carcass structure following shaping the carcass structure into a toroidal configuration.

30. (currently amended) An apparatus for assembling tyres for vehicle wheels, comprising:

- a primary drum;
- an auxiliary drum;
- devices for application of belt layers on the auxiliary drum to form a belt structure;
- at least one unit for applying a tread band onto the belt structure; and
- a transfer member;

wherein the primary drum is arranged to support a carcass structure,

wherein the carcass structure comprises at least one carcass ply in engagement with annular anchoring structures axially spaced apart from each other,

wherein the auxiliary drum is set to carry the belt structure,

wherein the auxiliary drum is arranged in coaxial-alignment relationship with the primary drum;

wherein the transfer member moves the belt structure from the auxiliary drum to the primary drum,

wherein the at least one unit for applying the tread band comprises at least one delivery member,

wherein the at least one delivery member lays down at least one continuous strip element of elastomer material in contiguous circumferential coils onto the belt structure;

an actuating assembly set to drive the auxiliary drum in rotation around a geometric axis thereof so that said strip-like element is circumferentially distributed on the belt structure, and to cause controlled relative displacements between the auxiliary drum and said at least one delivery member for distribution of said strip-like element so as to form said coils disposed in mutual side by side relationship to define the tread band; and

wherein said actuating assembly is arranged to cause translation of the auxiliary drum away from a vertical ~~plan~~ plane containing the rotation axis of the primary drum towards said at least one delivery member, starting from a position at which the auxiliary drum interacts with the devices for applying the belt layers, and to move the auxiliary drum away from said delivery member to position it again in axial alignment relationship with respect to the primary drum; and

wherein the apparatus is configured to dispose the carcass structure on the primary drum by assembling component parts of the carcass structure on the primary drum.

31. (previously provided) The apparatus of claim 30, wherein the at least one delivery member comprises at least one extruder.

32. (cancelled)

33. (previously provided) The apparatus of claim 32, wherein the actuating assembly operates on the auxiliary drum to move the auxiliary drum relative to the at least one delivery member.

34. (previously provided) The apparatus of claim 32, wherein the actuating assembly is integrated into a robotized arm engaging the auxiliary drum.

35. (cancelled)

36. (cancelled)

37. (new) A method of assembling tyres for vehicle wheels, comprising:
providing at least an assembly station;

constructing a plurality of tread bands for a plurality of tires, including:

constructing at least one first tread band using a first process, wherein
constructing each of the at least one first tread band with the first process
includes executing the following operations at the assembly station:

providing a semi-finished tread band strip in the form of a semi-finished product;

cutting from the semi-finished tread band strip a semi-finished tread band strip section of a given length;

circumferentially winding the semi-finished tread band strip section
on a first belt structure for a first tire being processed; and
joining end-to-end the semi-finished tread band strip section wound
on the first belt structure;
providing an assembling apparatus;
operating the assembling apparatus to supplement the first process in
constructing the plurality of tread bands, including:
disposing a carcass structure on a primary drum;
disposing a second belt structure for a second tire on an auxiliary drum;
picking up the second belt structure from the auxiliary drum to transfer the
second belt structure to a position coaxially centered with respect to the carcass
structure; and
applying a spirally wound tread band onto the second belt structure;
wherein the carcass structure comprises at least one carcass ply in
engagement with annular anchoring structures axially spaced apart from each
other,
wherein the second belt structure comprises at least one belt layer, and
wherein applying the spirally wound tread band is carried out by winding
up at least one continuous strip element of elastomer material in contiguous
circumferential coils around the second belt structure.

38. (new) The method of claim 37, wherein applying the tread band is carried
out before picking up the belt structure from the auxiliary drum.

39. (new) The method of claim 37, wherein the at least one strip element is fed from at least one delivery member disposed close to the belt structure, simultaneously with winding up the at least one strip element around the belt structure.

40. (new) The method of claim 39, wherein feeding the at least one strip element is carried out by extrusion through the at least one delivery member.

41. (new) The method of claim 39, further comprising:

giving the auxiliary drum carrying the belt structure a circumferential-distribution rotary motion around a geometric rotation axis of the auxiliary drum, so that the at least one strip element is circumferentially distributed around the belt structure; and

carrying out controlled relative transverse-distribution displacements between the auxiliary drum and the at least one delivery member, so that the at least one strip element forms a plurality of coils disposed in mutual side-by-side relationship to define the tread band;

wherein giving the auxiliary drum the circumferential-distribution rotary motion and carrying out the controlled relative transverse-distribution displacements are carried out concurrently with winding up the at least one strip element.

42. (new) The method of claim 41, wherein the controlled relative transverse-distribution displacements are carried out by movement of the auxiliary drum.

43. (new) The method of claim 41, wherein the circumferential-distribution rotary motion and the controlled relative transverse-distribution displacements are carried out by an actuating assembly engaging the auxiliary drum.

44. (new) The method of claim 39, wherein before transferring the belt structure to a position coaxially centered with respect to the carcass structure, the auxiliary drum is moved away from the at least one delivery member to a position in which the auxiliary drum interacts with devices for disposing the belt structure.

45. (new) The method of claim 44, wherein after formation of the belt structure and before winding up the at least one strip element, the auxiliary drum is moved from the position in which the auxiliary drum interacts with devices for disposing the belt structure towards the at least one delivery member.

46. (new) The method of claim 37, wherein disposing the carcass structure on the primary drum is carried out by assembling component parts of the carcass structure on the primary drum.

47. (new) The method of claim 37, wherein the belt structure transferred to the position coaxially centered with respect to the carcass structure is coupled with the carcass structure following shaping the carcass structure into a toroidal configuration.

48. (new) A plant for assembling tyres for vehicle wheels including a plurality of tread bands for a plurality of tires, comprising:

an assembling station;

wherein the assembling station is configured to perform a first process to contribute to the production of the plurality of tread bands by producing at least one first tread band, the assembly station including:

a tread band extrusion line providing a semi-finished tread band in the form of a semi-finished product; and

a feeding unit providing the semi-finished tread band in the form of a section of given length which is circumferentially wound and end-to-end joined on a first belt structure of a first tire being processed;

an assembling apparatus;

wherein the assembling apparatus is configured to supplement the first process in production of the plurality of tread bands, the assembling apparatus including:

a primary drum;

an auxiliary drum;

devices for application of belt layers on the auxiliary drum to form a second belt structure for a second tire,

at least one unit for applying a spirally wound tread band onto the second belt structure; and

a transfer member;

wherein the primary drum is arranged to support a carcass structure,

wherein the carcass structure comprises at least one carcass ply in engagement with annular anchoring structures axially spaced apart from each other,

wherein the auxiliary drum is set to carry the second belt structure,

wherein the transfer member moves the second belt structure from the auxiliary drum to the primary drum,

wherein the at least one unit for applying the spirally wound tread band comprises at least one delivery member, and

wherein the at least one delivery member lays down at least one continuous strip element of elastomer material in contiguous circumferential coils onto the second belt structure.

49. (new) The apparatus of claim 48, wherein the at least one delivery member comprises at least one extruder.

50. (new) The apparatus of claim 48, wherein the at least one unit for applying the tread band comprises:

an actuating assembly;

wherein the actuating assembly drives the auxiliary drum in rotation around a geometric axis of the auxiliary drum so that the at least one strip element is circumferentially distributed onto the belt structure, and

wherein the actuating assembly causes controlled relative transverse-distribution displacements between the auxiliary drum and the at least one delivery member for

distributing the at least one strip element to form the circumferential coils disposed in mutual side-by-side relationship that define the tread band.

51. (new) The apparatus of claim 50, wherein the actuating assembly operates on the auxiliary drum to move the auxiliary drum relative to the at least one delivery member.

52. (new) The apparatus of claim 50, wherein the actuating assembly is integrated into a robotized arm engaging the auxiliary drum.

53. (new) The apparatus of claim 50, wherein the actuating assembly comprises:

a carriage movable along a guide structure between a first position and a second position;

wherein in the first position, the carriage supports the auxiliary drum near devices for disposing the belt structure, and

wherein in the second position, the carriage supports the auxiliary drum near the at least one delivery member.

54. (new) The apparatus of claim 50, further comprising:

devices for applying belt layers on the auxiliary drum to form the belt structure;

wherein the actuating assembly is arranged to cause translation of the auxiliary drum towards the at least one delivery member, starting from a position in which the auxiliary drum interacts with devices for disposing the belt structure.

55. (new) A plant for assembling tyres for vehicle wheels including a plurality of tread bands for a plurality of tires, comprising:

first assembly equipment that produces at least one first tread band for at least one first tire by end-to-end joining a section of a semi-finished tread band strip on the at least one first tire; and

second assembly equipment that supplements tread band production of the first assembly equipment toward the production of the plurality of tread bands by constructing at least one spirally wound second tread band on at least one second tire.